

FINAL CLOSE-OUT REPORT

TRACY WATER SYSTEM EXTENSION PROJECT

FOR

DEPARTMENT OF STATE LANDS

ABANDONED MINE RECLAMATION BUREAU

HELENA, MONTANA

BY

DELTA ENGINEERING, P.C.

GREAT FALLS, MONTANA

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TRACY WATER SYSTEM EXTENSION PROJECT

PROJ. No. IFB 7354-G

INDEX

- I. INTRODUCTION
- II. DESCRIPTION OF CONTRACT
- III. LIST OF EQUIPMENT USED ON PROJECT
- IV. PLANNING PROBLEMS ENCOUNTERED
- V. COST SUMMARY
- VI. SUMMARY OF JOB

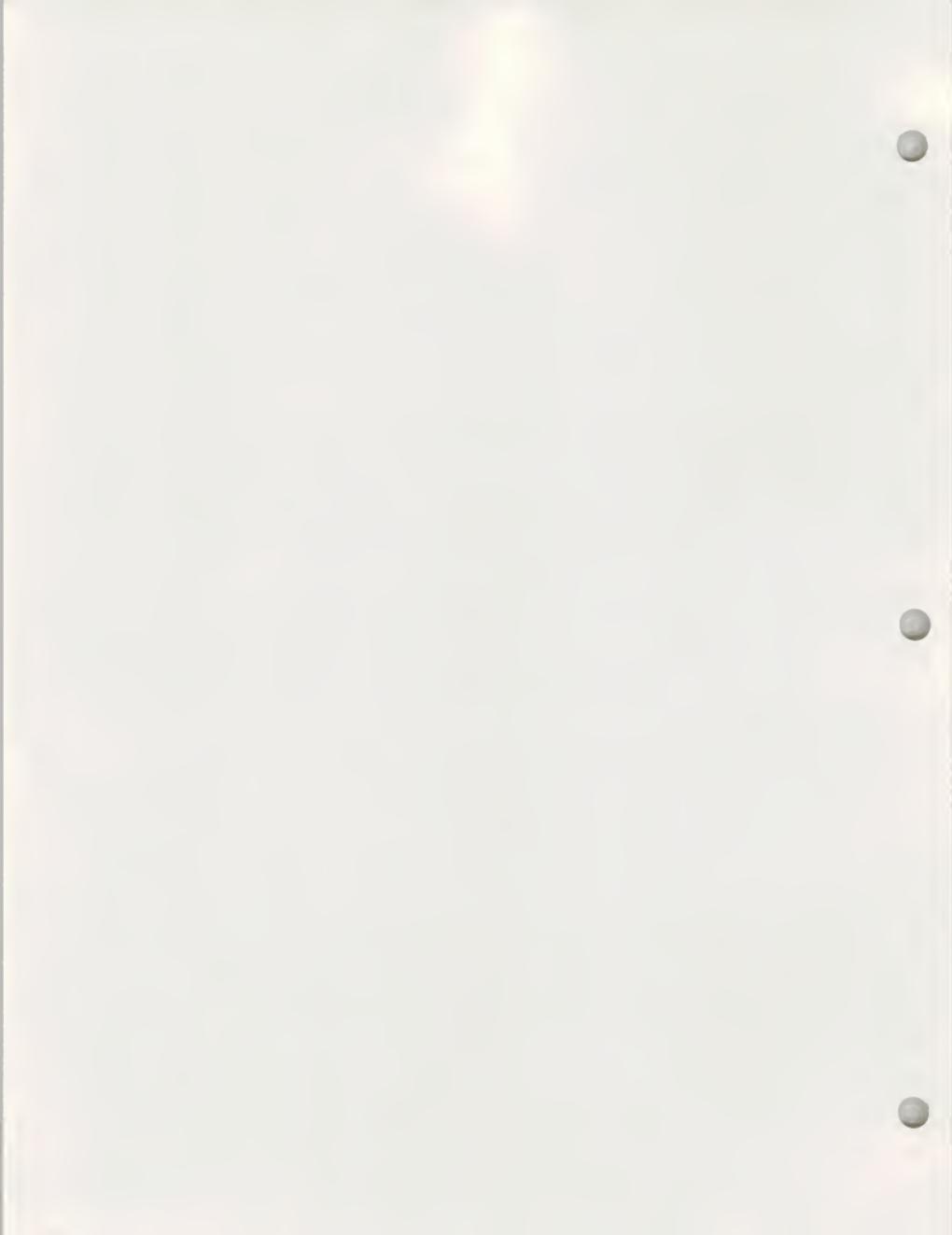


TRACY WATER SYSTEM EXTENSION

I. INTRODUCTION

Tracy is a small community located about 13 miles southeast of Great Falls near the towns of Sand Coulee and Centerville and more specifically in the east half of SEC. 12, T19N, R4E and the west half of SEC. 7, T19N, R5E, Cascade County, Montana. The project site is within the community of Tracy and includes the replacement of several older water mains and service connections and the addition of some new distribution lines to provide potable water to portions of Tracy. Specifically, a 3 inch water main was extended west of Tracy to provide water service to four households whose private water wells had been contaminated due to past coal mining activities.

In addition to the replacement of the new water mains and services, a new higher capacity pump was installed in an existing water well to increase the well yield in order to provide the increased water requirement needed to service the four households. A pump control system to automate the



operation of the newly installed pump and two other standby or emergency pumps was also installed.

The objectives of the project are outlined as follows:

- provide domestic water to existing households having contaminated wells;
- increase well capacity, pumping operation, and distribution piping sizes in Tracy to provide additional water needed by the households and to meet State health regulations;
- allow sufficient excess capacity to service future households whose wells or water sources become contaminated.



III. DESCRIPTION OF CONTRACT

<u>BID DATE</u>	MARCH 28, 1986
<u>Three lowest bidders</u>	1. G-M Construction Box 273 Lincoln, MT BID \$45,901.03
	2. Gordon Construction Belt, MT BID \$63,908.07
	3. Excavating Service Belt, MT BID \$72,852.10

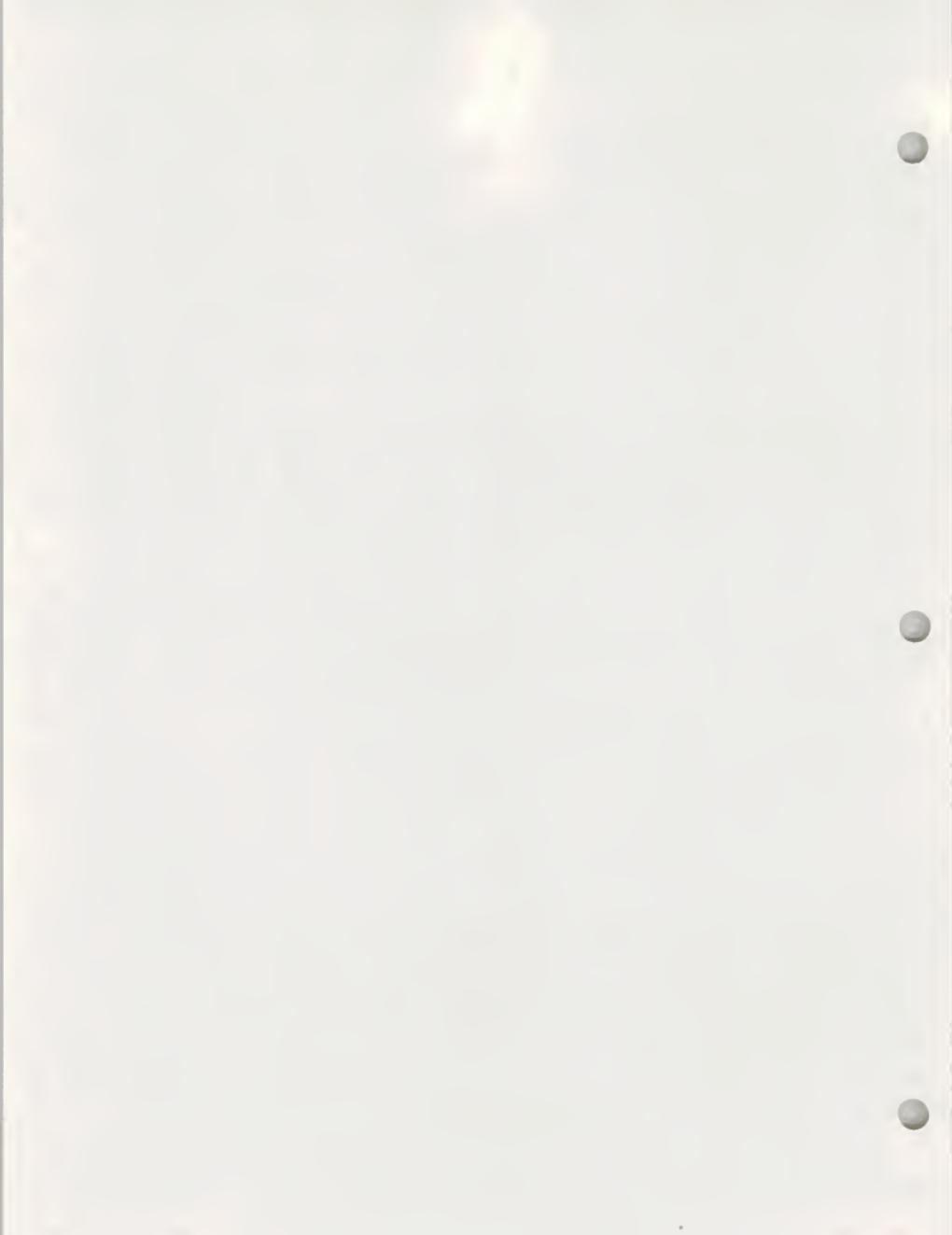
<u>CONTRACTOR AWARD DATE</u>	APRIL 4, 1986
	to G-M Construction
<u>NOTICE TO PROCEED</u>	APRIL 20, 1986
<u>PRECONST. MTG DATE</u>	MAY 6, 1986
<u>START UP DATE</u>	MAY 6, 1986
<u>SHUT DOWNS</u>	MAY 8, 1986
	Late arrival of fittings
	MAY 9, 1986
	Late arrival of fittings
	MAY 12, 1986
	Late arrival of fittings
<u>COMPLETION DATE</u>	JULY 3, 1986
<u>REPAIRS MADE AFTER COMPLETION DATE</u>	NOVEMBER 9, 1986
	NOVEMBER 29, 1986
<u>DSL SUPERVISOR</u>	MR. MIKE HIEL
<u>DELTA ENGINEERING INSP.</u>	MR. THOMAS WARD

III. LIST OF EQUIPMENT USED ON PROJECT

<u>TYPE</u>		
Rubber tire backhoe	CASE 500-C	1
Bobcat w/bucket & backhoe attachments	Bobcat 843	1
14 CU.YD. End dump	Chevrolet	1
Hand operated wacker	CASE	1

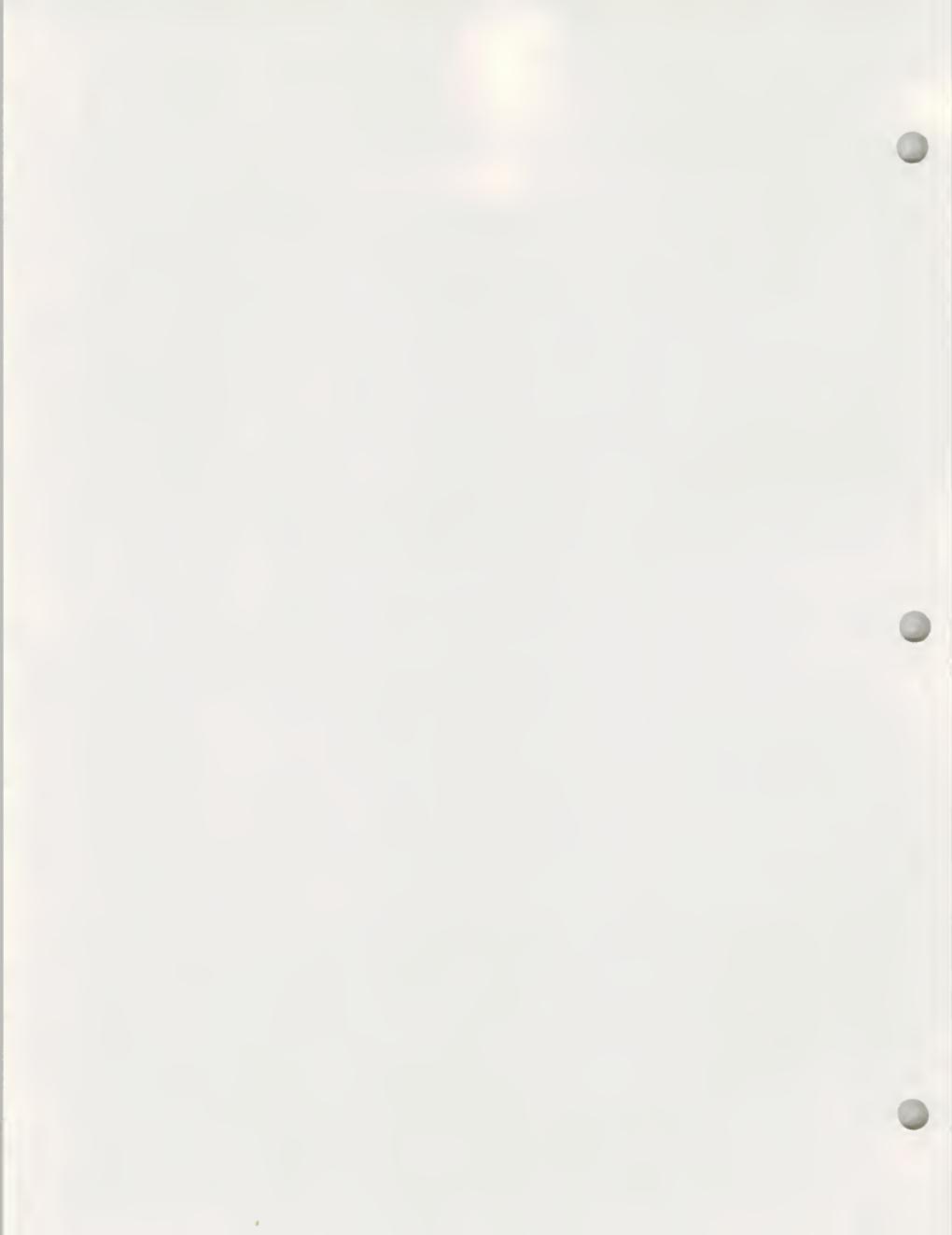
METHODS USED IN PROJECT

Excavated trench using CASE 500 C backhoe
Backfilled in lifts using Bobcat 843
Compaction completed by hand operated wacker



IV. PLANNING PROBLEMS ENCOUNTERED

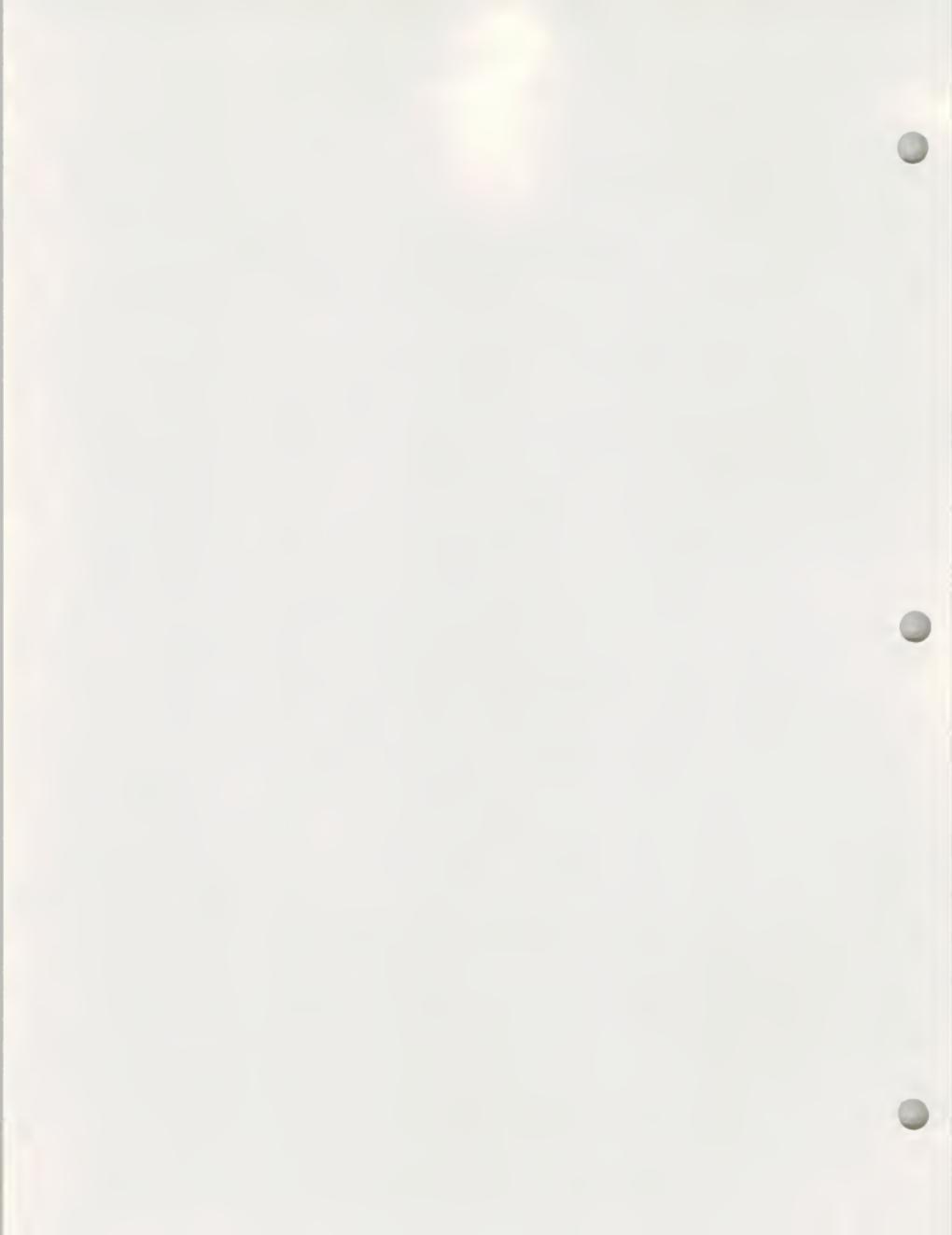
Lack of any previous engineering drawings, as-builts, plans, or records of the water distribution system created several design problems which carried over into the construction phase of the project. Type of pipe, sizes, locations, fittings, valve locations, service lines and the absence of valves and curb stops were largely unknown until excavation occurred. This complicated the construction scheduling and resulted in some temporary water interruptions and in one instance a leaky water main.



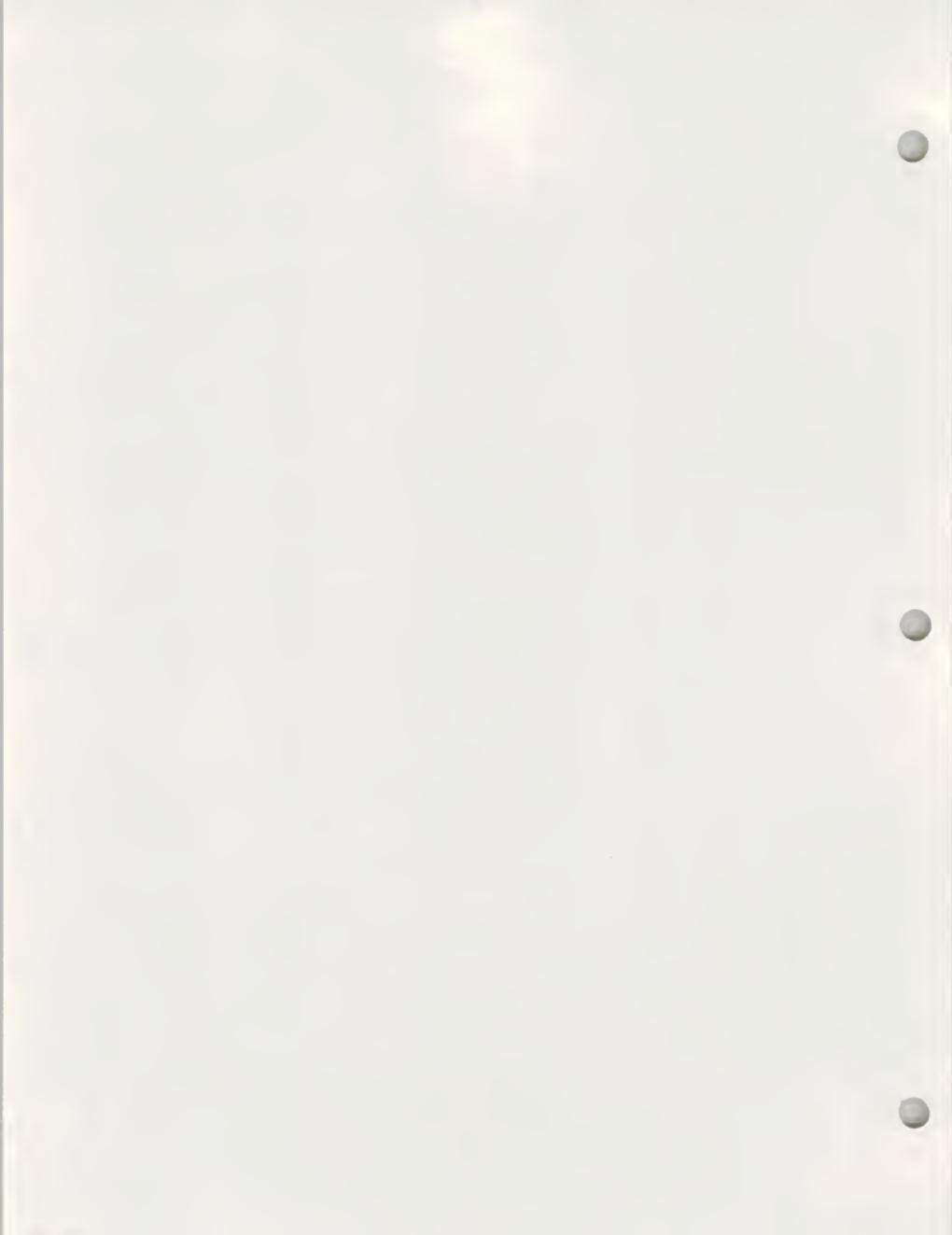
V. COST SUMMARY

BREAKDOWN OF CONSTRUCTION ITEMS/COSTS

ITEM	QUANTITY	BID PRICE	TOTAL COST
ORIGINAL CONTRACT ITEMS			
6" C900 PVC pipe	1446 LF	\$ 5.35/LF	\$7,736.10
3" CL160 PVC pipe	1249 LF	3.24/LF	4,046.76
1 1/2 CL150 PVC pipe	800 LF	2.89/LF	2,312.00
6" Gate valve	5 EA	361.50 EA	1,807.50
3" Gate valve	7 EA	240.50 EA	1,683.50
1 1/2 Curb stop	2 EA	121.50 EA	243.00
Fire hydrant	3 EA	1,289.00 EA	3,867.00
Cast iron fittings	1570 LBS	1.73/LB	2,716.10
Water service reconnection	10 EA	121.30 EA	1,213.00
Water service connection	2 EA	120.50 EA	241.00
Water line connection	1 LS	1,361.50	1,361.50
Crossing	1 LS	2,248.53	2,248.53
Pavement replacement	130 SY	5.08/SY	660.40
Relocate UG telephone	120 LF	1.10/LF	132.00
Standpipe/fitting device	1 LS	687.50	687.50
Instrumentation	1 LS	11,997.00	11,997.00
Manhole w/6"GV	1 LS	1,474.07	1,474.07
Manhole w/3"GV	1 LS	1,474.07	1,474.07
TOTAL			\$45,901.00



<u>Change Order Items</u>	<u>QUANTITY</u>	<u>BID PRICE</u>	<u>TOTAL COST</u>
<u>Additions</u>			
6" C900 PVC pipe	23 LF	5.35/LF	123.05
3" CL160 PVC pipe	394 LF	3.24/LF	1,276.56
6" Gate valve	1 EA	361.50 EA	361.50
3" Gate valve	3 EA	240.50 EA	721.50
Cast iron fittings	218 LBS	1.73/LB	377.14
Water service reconnection	6 EA	121.40 EA	728.40
Water service connections	3 EA	120.50 EA	361.50
Service hookup	65 LF	3.24/LF	210.60
Yard hydrant	1 EA	90.00 EA	90.00
3/4" PE pipe	117 LF	2.89/LF	338.13
12 LF encasement	1 LS	200.00	200.00
Repair 3" 45° bend	1 LS	70.00	70.00
Fill around MH	50 CY	10.00/CY	500.00
Repair wing wall	1 LS	130.00	130.00
Replace 3" GV	1 LS	200.00	200.00
<u>Deletions</u>			
1 1/2" CL150 PVC pipe	20 LF	2.89/LF	(57.80)
Relocate UG telephone	120 LF	1.10/LF	(132.00)
CHANGE ORDER TOTAL			\$ 5,498.58
GRAND TOTAL			<u>\$51,399.61</u>



VI. SUMMARY OF JOB

The objectives of the construction project were successfully achieved according to the plans & specifications and the goals of the DSL-Abandoned Mine Reclamation Bureau.

The following is an outlined summary of the work completed.

An existing 5 HP pump was pulled from well #3 and replaced with a new 7 1/2 HP pump to increase the well capacity from 40 gpm to 80 gpm. A new instrumentation and control system to automatically regulate the operation of the pump(s) and to maintain a safe level of water in the water storage tank was installed in an existing pump control building. The entire pump control system was rewired to meet current electrical codes.

Several older water mains which were insufficient in size or pressure rating to carry the required quantity of water were abandoned in place and a new 6 inch pipe installed. The new 6 inch distribution main was installed along a portion of Blaine Street and in the entire Blk #7 alley. The new 6 inch distribution main provided the quantity of water necessary for the outlying areas of the community and also enabled the installation of three hydrants for fire protection which the community had previously been without.



A new 3 inch transmission main was installed on the north side of the community between alleys 3 and 5. This enabled a loop to be completed so if repairs to that portion of the community were necessary, a portion of that area could be shut down without having to shut down the entire north side of town. An additional 3 inch transmission line was installed on the west end of town to replace existing lines and to provide water service to four residences where past coal mining activities had contaminated the water well supplies. Change order No. 2 enabled the installation of a new 3 inch distribution main on a portion of Meyer Ave. to replace an inaccessible line.



ATTACHMENT I

ANALYSIS OF CONSULTANT COSTS

PROJECT NAME: Tracy Water System Extension

PROJECT NO.: IFB 7354-G

DATE PREPARED: January 1987

<u>SERVICE</u>	<u>AMOUNT</u>
ENGINEERING DESIGN	
1985	\$ 4,410
1986	<u>6,490</u>
SUBTOTAL ENGINEERING DESIGN:	10,900

CONSTRUCTION INSPECTION AND ADMINISTRATION

1986	<u>10,075</u>
SUBTOTAL CONSTRUCTION INSP. & ADMIN.	10,075 TOTAL
PROJECT ENGINEERING COST:	\$20,975
TOTAL CONSTRUCTION COST:	\$51,400

COST COMPARISON - PROJECT ENGINEERING/CONSTRUCTION

ENGINEERING DESIGN/CONSTRUCTION	21%
CONST. INSP. & ADMIN./CONSTRUCTION	20%
TOTAL PROJECT ENGINEERING/CONSTRUCTION	41%

